(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 July 2005 (07.07.2005)

PCT

(10) International Publication Number
WO 2005/062079 A3

(51) International Patent Classification[7]: H01L 21/18, H01S 5/026

(21) International Application Number: PCT/GB2004/005452

(22) International Filing Date: 24 December 2004 (24.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0329915.3 24 December 2003 (24.12.2003) GB

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,

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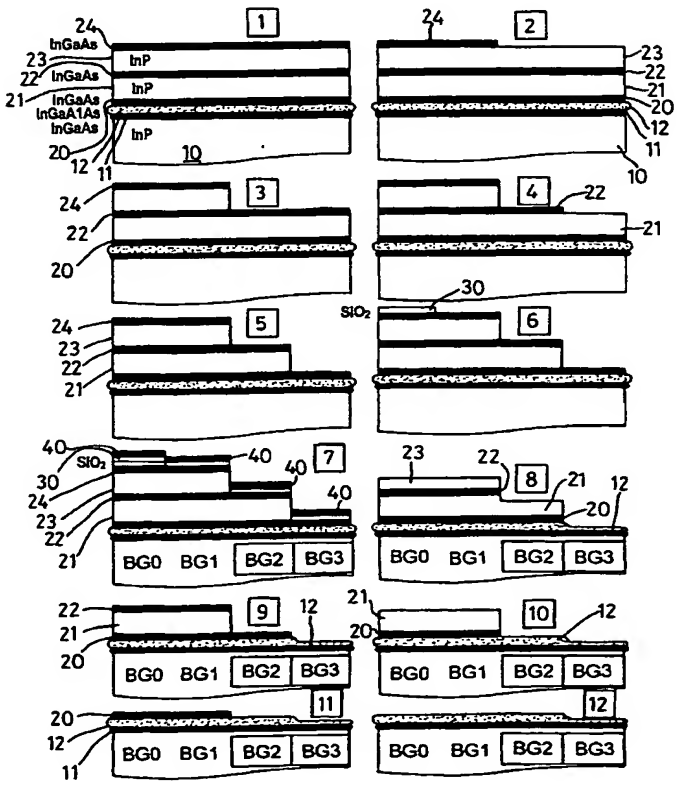
(54) Title: GENERATING MULTIPLE BANDGAPS USING MULTIPLE EPITAXIAL LAYERS



(57) Abstract: A quantum well intermixing (QWI) technique for modifying an energy bandgap during the formation of optical semiconductor devices enables spatial control of the QWI process so as to achieve differing bandgap shifts across a wafer, device or substrate surface. The method includes: forming a substrate comprising one or more core layers defining at least one quantum well; depositing a succession of intermixing barrier layers over the quantum well, each successive intermixing barrier layer being formed of a semiconductor material and having a different etch characteristic than an immediately preceding barrier layer; etching away different numbers of the successive barrier layers in different regions of the substrate so as to provide different total thicknesses of barrier layer in different regions of the substrate; and applying an intermixing agent to the surface of the substrate such that the degree of intermixing in the quantum well region varies as a function of the total thickness of barrier layer, thereby forming different bandgaps in the quantum well in each of the respective regions.

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PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) **Date of publication of the international search report:**
25 August 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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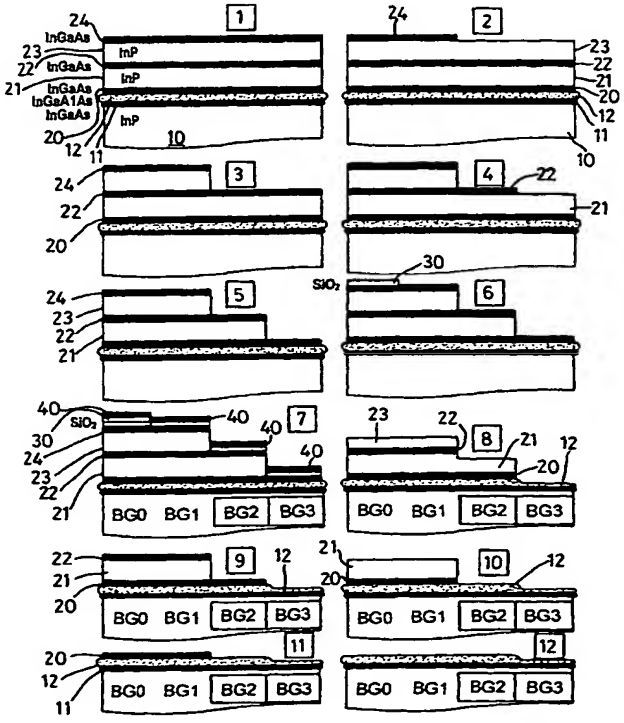

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Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) **Date of publication of the international search report:** 25 August 2005
Date of publication of the revised international search report: 6 October 2005

(15) **Information about Correction:**
see PCT Gazette No. 40/2005 of 6 October 2005, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.